

ENGINEERING HERITAGE WESTERN AUSTRALIA

WESTERN AUSTRALIAN ENGINEERING ORAL HISTORY PROGRAM

Transcript of Interview with

Roslyn MacKinlay



Interviewer	Patsy Vizents Back When: Oral Histories Hamilton Hill, WA 6163
Transcriber	Patsy Vizents
Initial Interview	12 December, 2019
Duration	57 minutes 22 seconds

NOTES TO THE READER ON INTERPRETATION OF THIS TRANSCRIPT

Readers of this oral history transcript need to be aware that is a near verbatim transcript of the words as spoken during the interview that was conducted in the form of a natural conversation between the interviewer and the person being interviewed. Some minor changes may have been made to facilitate the flow of the document.

Much of what is said in such interviews relies upon the accuracy of the memory of the person being interviewed and readers should bear this in mind and judge for themselves how factually accurate the material is. The interviewer has sought to clarify or verify facts and statements made during the interview where this seemed appropriate.

The views and opinions expressed within the transcript are those of the person expressing them in the interview.

Please refer to the notes on the following page to aid interpretation of the transcript.

Note 1

The recording comprises one part in 'wav.' format. It runs for a total of 57 minutes and 22 seconds.

Note 2

Where the interviewer has used words such as “Yes”, “Right” or “OK” as an encouragement, or may have used an habitual phrase, but not as anything else, then these words have not been transcribed unless they are relevant for the context.

Note 3

Where a sentence has a series of dots in the text such as . . . indicates that the speaker paused, the recording was not clear enough to transcribe accurately what was said, there was a pause, or the following speaker interrupted what was being said.

Note 4

In the transcript, the interviewer's contribution is in **bold** and the interviewee in standard text.

Note 5

The timing indicated in the transcript indicates the position in the interview and is a guide which is linked to the Interview Log.

0:00

My name is Patsy Vizents and on behalf of Engineering Heritage Western Australia National Oral History Program, I am conducting an oral history interview with Roslyn MacKinlay nee Clark, in her home in Beaconsfield, Western Australia. Today is Thursday the 12th of December, 2019.

Before we start, I need to make sure you understand your rights in relation to this interview. So, do you understand that you will control information given in this interview by filling in the Consent Form?

Yes, I do

And do we have your permission to make a transcription of the recording?

Absolutely, yes.

Thank you. Now, I remind you that you can terminate this interview at any time, so thank you for agreeing to do this, this is going to be terrific. You will have your own copy. I will be able to provide you with your own audio copy and the hard transcription copy.

OK, that will be great.

I guess, to get the ball rolling, can you introduce yourself and give us a background as to where you grew up.

I'm Roslyn MacKinlay, Ros MacKinlay now. I was born Roslyn Clark and my parents were farmers in the Wongan Hills/Cadoux area, in fact my Grandfather was a pioneer there and started the farm in 1906 and I spent the first 12 years of my life on the farm, going to primary school there and then I went to boarding school. Laughter.

Did you say Wongan Hills?

Wongan Hills is the nearest big town and Cadoux is a little satellite town from there and it's about 140 kilometres north east of Perth.

So, what kind of farm?

It was a wheat and sheep farm and Mum and Dad were there, when I was growing up they were the best years they had, I think. No droughts, no anything so it was, yeah, they were quite wealthy.

So, when was your birth date?

I was born in 1949.

And do you have siblings?

I have an older brother, deceased and an older sister who is still alive. Garry was six years older than me, my sister four years old(er), then myself and a younger brother, five years younger than me.

OK, do you want to give their names?

My older brother was Garry, Garry Clark and my sister is Helen Clark and my young brother, Greg Clark.

Is Helen Clark an artist?

She is, yes.

Did she live on a boat?

Yes, she did.

I used to teach with Helen Clark (laughter), at Perth Tech.

Yes, she did her art course through there, through Perth Tech. Was she teaching art when you . . .

She was teaching, yes.

She did start out as a primary school teacher and hated it and went back to Uni and . . . She is still an artist and still doing art and living in Geraldton.

Well that's lovely, good. So, did you all go to the local primary school?

Yes, local primary school up until 12 and Wongan Hills had a junior high which meant schooling finished at 15 and if we'd gone there, Helen and I would have ended up staying there forever and marrying farmers. I think our parents thought we should have a bit of an alternative (laughs) choice, in the matter. So, we all went to boarding school. My elder brother interestingly, only went to sub-leaving which is 16, which is what farmer's sons did in those days. They didn't bother with doing their leaving because they were going to go back to the farm. So, they did their junior, passed that and had a fun year and then went back to the farm. My sister thought she wanted to go to Uni but my parents thought their obligations stopped when the daughters turned 18, so the parents would not be involved in funding her to go to University. So that's why she went to Teacher's Training College to get her Arts Degree. I was four and a half years younger by the time I got to that level, Mum and Dad decided they didn't want to go farming all their lives, keep farming forever, so they decided they would change the rules. So, my younger brother was brainwashed not to be a farmer, ended up being a doctor. They did all sorts of things, the rules were relaxed, I got a scholarship, but they underwrote me through University whereas, they hadn't done that for the older two. The rules had changed.

Did they leave the farm to the oldest, to Garry?

No, so when Garry came back to go farming, Mum and Dad were still going to farm until my younger brother was going to take over the farm. They actually bought him a farm out at

Wialki. Wialki, which is way out in the sticks, passed Mukinbudin. So, he farmed out there for a number of years and went cray fishing and all sorts of different things. Laughs. I could do the interview about him and it would take quite some time.

No, (laughing). So, you have given a pretty good idea of what happened; off to boarding school, what school did you attend?

I went to Methodist Ladies' College (laughter) which is where I think . . . my sister had gone there, a few people from the Cadoux area went there and my brothers went to Scotch College because a lot of kids from our area went there, and also my family. My father had been there so there were so many people we knew, my brothers went to Scotch. So effectively, we left home at 13. Went back to the farm for holidays, only some of them. Most of the summer holidays we spent in Perth. Dad got into little boats and we used to go water skiing and all sorts of things so I wasn't on the farm much after I was 13.

Did you miss the farm?

I did. I loved the freedom. You know, I used to take myself off on picnics when I was little, just on my own. Yes, I did miss the farm to a certain extent but I like people too so being in the city was a better option.

When you were in secondary school, was there anybody teaching you or did you come across any influences that gave you that indication "that's what I want to do" in the future?

No, not initially. I was much better at the sciences than the arts so I did mainly science subjects and because of that, I wasn't allowed to do typing and domestic science, which I wanted to do as well but we weren't allowed to (laughs). It's against the rules (laughing) of the school. As time progressed through schooling, I worked out, if I did end up doing a degree or something in science, I would probably end up teaching, and I knew I didn't want to teach. I was very shy, coming from the country so I knew I would not enjoy standing up in front of a whole bunch of, a classroom of kids and telling them what to do. I didn't know what to do really except we had a really good Careers Guidance Counsellor and she chatted to me and suggested engineering.

8:00

When I told my parents that she had suggested engineering, they said fine (laughing). They were not remotely phased but I met a boyfriend that I met in final year of school and his parents lived in Dalkeith and were part of high-society in Dalkeith, and they were horrified that I was going to do engineering.

Why was that?

Because girls don't do engineering (laughing). Girls should stay at home and look after their husbands, that was my father-in-law's take on the world and he maintained that forever. He, it was jocular at the time but when he got old and slightly demented, he said I wasn't a proper wife because I didn't stay and iron my husband's shirts (laughing).

That was fairly prevalent. So, what year are we talking about at the end of high school?

End of high school - my first year of Uni was 1967, so I finished high school in 1966.

You went straight into Uni, on a scholarship.

Straight in – oh, in those days, you did not take a gap year. If you took a gap year, you were a wastrel. It wasn't done. You went straight from school, to Uni, to work and got married somewhere in that bit. Had your children and bla! It was a big no-no to take a year off. You were looked down on if you took a year off.

Is that because, well you were a wastrel; were you wasting time and money, if you were being funded.

Yes, well if you took a year off like everyone does now and work . . .

You would go off and get your money.

It wasn't an option. Not to be discussed.

No.

From anywhere (laughing).

It's interesting because it has completely changed, that idea of preparation for tertiary (education) and things like the Leavers' Party . . .

Yes, well we never had any of those, no, no. And I think it's fantastic that kids, it's almost automatic that they will take the year off and have a relax because that last year of schooling is such a hard year. Always has been and everything about the rest of your life rests on that Year 12 . . .

It's frightening. So, a Counsellor indicated to you because of your grades and inclination. Did you know anything about what engineering would provide you with?

No (laughter)

Did the Counsellor say, this is what they do?

Well I guess I must have known because I read and I knew what engineers did; build things, design and build things, so everything around it. I didn't know the detail about what they did.

So, were there work experience days?

No, oh actually . . . not that was in Uni. No, there weren't but between school and Uni, because some of the boys had done tech drawing in high school and I hadn't, and there were quite a few of the boys who hadn't as well, we had a one week course in tech drawing at Uni so that was it. The only sort of pre-training. I think everything else. I did all the same sciences and maths as all the other people

How were you selected? Was there a selection process to get in?

No, they took everybody. Well, I think they had a quota, I think it was about 200; it was very large for first year and in those days, half the people dropped out for whatever reason after first year so, that had been the pattern I think. It was easy to get in, almost impossible not to get in, in those days. Obviously quite different now.

So, it was really based on what you achieved in your Leaving . . .

Oh yes, you obviously had to have done, passed all the, I don't think you needed to have passed them very highly but you had to have passed the . . . physics, chemistry and the two maths

Maths 1, maths 2

Yeah, the two maths we did in those days and I think you had to have passed English and I don't think they had to be high marks in those days. If you had passed, you were in.

There are a lot of newspaper articles that you have shown me that at the end of your four-year degree, there was a lot of publicity about you being the first female graduate, but you weren't the first to enrol into the course.

No, no. I didn't know until a couple of years into my course that there had been a Vietnamese girl who was doing Electrical Engineering, I have her name somewhere, who got through to final year, and then died, I suspect of sepsis. I heard she got blood poisoning from having a tooth pulled or something like that. So, she didn't graduate.

From having teeth pulled?

From having teeth pulled, that's what I was told.

So, she would have possibly have been the first . . .

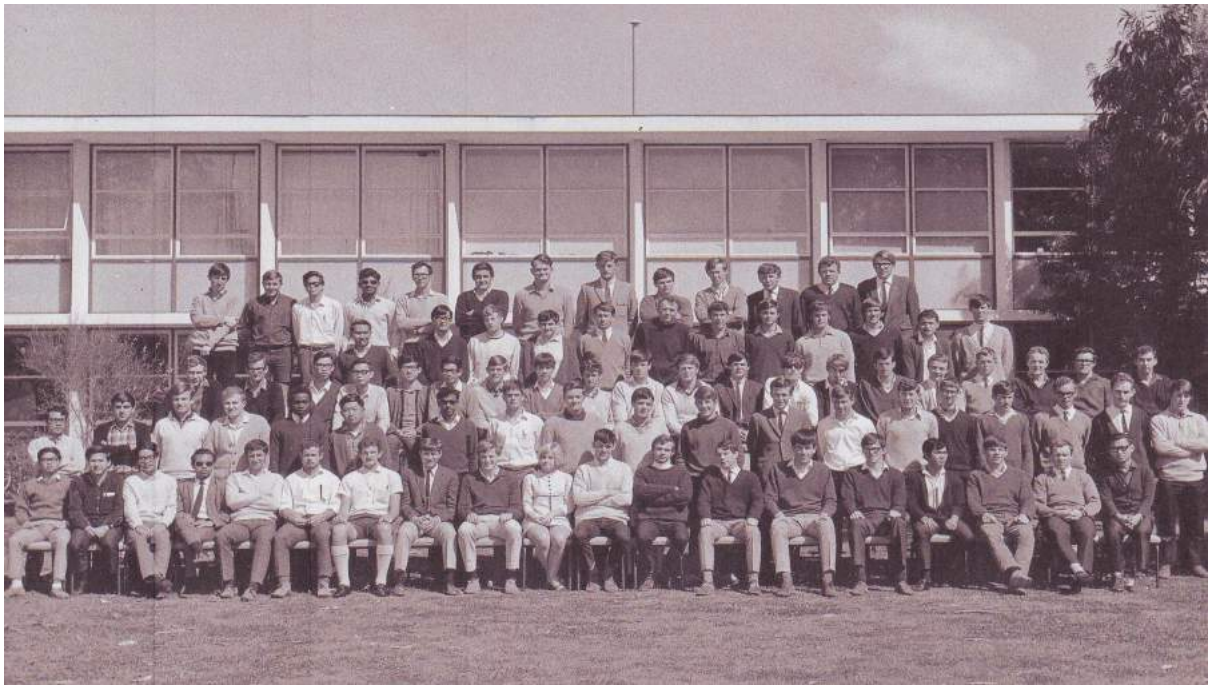
She would have been the first, yes, from UWA.

That is quite amazing because the school has been in existence for a long time.

Yes, that's right. Girls did not do engineering, here. But in places like Russia, they have been doing it forever (laughing), but it wasn't a girl's profession.

How did you feel in your first year? You get there and there's 200 people, all doing the Engineering first year

Yes, I don't remember there being, even though I have said, I came from the country and I was nervous when I was younger, I don't remember being nervous. I'd gone from an all-girls school to University where it was nearly all boys, but I don't remember feeling any apprehension. I think did what I do in lots of situations, I didn't say a lot to start with, just sort of listened, listened more than I spoke, but the guys who used to sit next to me or what ever in lectures, they were obviously the ones who approved or didn't mind a girl being in Engineering and the others who didn't, I didn't actually see them. No one was rude to me.



1968 School of Engineering University of Western Australia students. Roslyn Clark seated centre front

14:30

You didn't receive any preferential treatment or . . . what's the opposite, differential?

No, no. I don't think so, not that I noticed. So, it was perfectly normal to me. I suppose what also helped me, as I entered Uni, I had a long-term boyfriend who was in the Law Faculty so everyone knew I wasn't there looking for the boyfriend (laughing).

And yet, clearly you were an attractive, that '60s look that you carried must have had some kind of allure, some sort of shock value in a way. It must have been a very interesting experience for you.

Yes, as I said, to me I knew I had to work a bit harder than the others to make sure I got through because I didn't want people saying, oh, you know, you failed because girls aren't good at this stuff. So, I probably worked harder than some of them did.

Do you recall names of your fellow students from that first intake?

I would have to jog my memory with the books here, but yes, I still . . . I think the last reunion we had was about eight years ago and for the civil engineers who graduated in 1970/71 and I still know a lot of them, but pulling the names out right now, I'd have to get my little book out. I will do that actually. (Roslyn moves to a shelf and finds a book).

The Graduation Ceremony book, that should tell me. Faculty of Engineering. There's quite a few names I *don't* remember. One of course, actually the first year I was there, Joe Wyche or his real name, Peter Joseph Wyche, but Jo Wyche actually started a year ahead of me but he did manage to fail a year (laughs) so, we graduated together but he was, I've told you, I worked with him for a fairly long term, helping to design bridges. So, there's Steve Wade, Alan Smith, I'm just telling you the ones I remember, John Massey, Doug Humphries, Graham Elderfield, Rick Diamond, Geoff Crow, Paul Coronell, John Carrow, Rod Banyard,

there's quite a few Asian names and I don't remember any of them. Did I say Dave Warnock, and there were quite a few in the ones that graduated – oh there's the guys with Honours, I've missed them! Lou Zekius, Rob Harvey, I got Honours (laughter) class B (laughter) but you know, I got Honours. Con Condipodero, Geoff Cox, Chester Burton and Phil Naderbalm. They are all people who I would recognise if I saw them again.

That's a lot, what about lecturers like how I discussed with your secondary, were there particular lecturers that fired your curiosity or your interest in particular topics and subjects?

I can't say that in particular, I'm just opening up a Non Loqui, Professor Alan Williams was actually Professor who was Dean at the time, they had a rotating Deanship and he was the person, when I first went there, he was the person who interviewed me.

So, you did have an interview . . .

That's right, I had to have, I passed everything but I had to have an interview, I'd forgotten that bit. So, I had an interview with Professor Alan Williams when he was Dean before I started Uni and he wasn't that enthusiastic but he didn't say I couldn't do it. I think they had a few issues like female toilets and I think I had to use the staff one in the first year or two (laughter) but he wasn't negative, he just wasn't 100% positive. Some of the other lecturers were John Wager, who is the father of Sue who was head of the Water Corp. There was another guy who I ended up working with, he was a Professor of Civil Engineering, Ralph Ansley. When I left Uni, he was one of my lecturers there and he was going out into private enterprise and I ended up working with him for a few years. He was only at UWA for about three years, he travelled to various universities around the world and enjoyed himself and taught.

So, the course itself is four years and in the first year, it's a general year?

Yes, exactly. In fact, when I started it was just in transition. The people who graduated in the previous year had actually done four and a third years, it was transitioning from a five-year course to a four-year course. In fact, my future brother-in-law was in the last year that did four and a quarter years; he did Engineering, David MacKinlay.

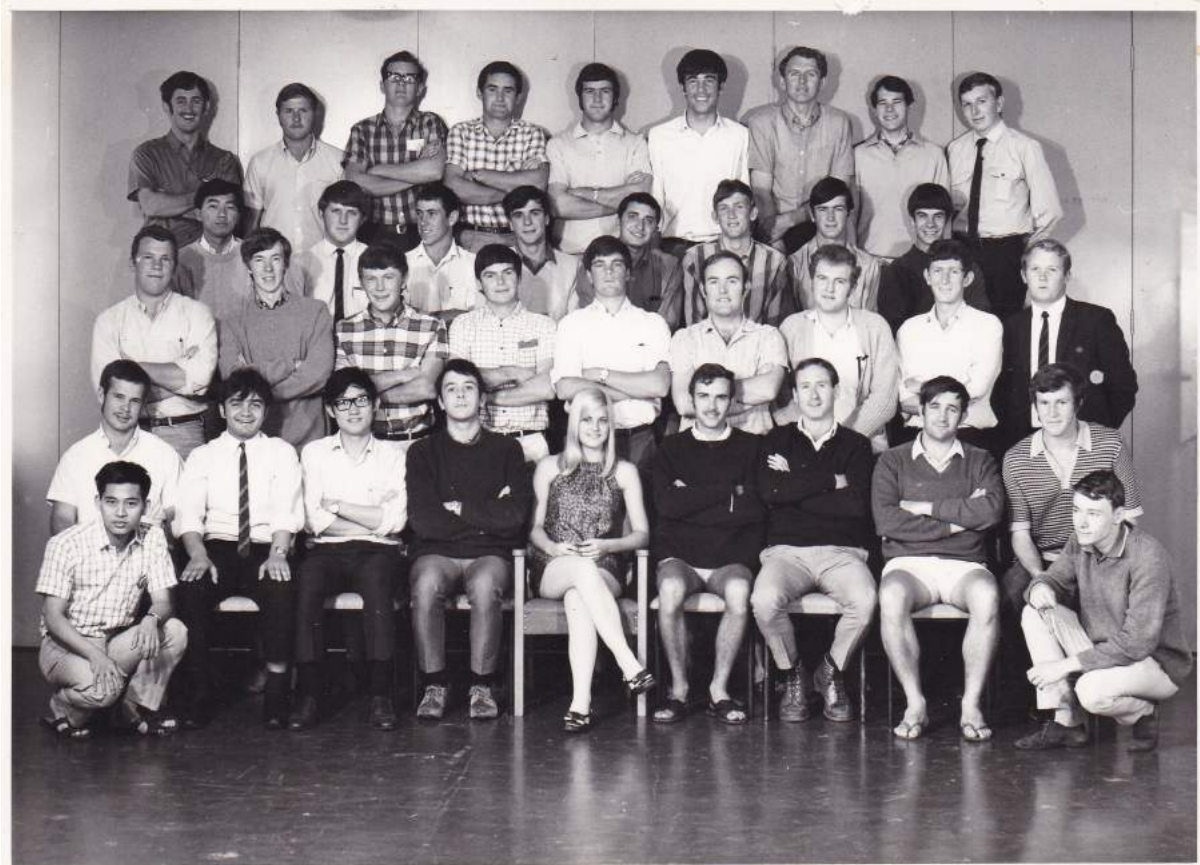
20:00

By the time all of us started, it was a four-year course. In the first year, yes we did, in fact we repeated physics and chem, pretty much what we already knew from year 12. And then a general engineering course where everyone did it; the guys who were going to branch off into electrical, mechanical, civil and structural, we were all in the same general engineering class.

So, there were four branches that you eventually ended up selecting?

Three really. So, civil and structural are one and electrical/electronic was the other one and mechanical. So really, in those days, three. I don't know if they have subdivided it more now. At the end of second year, you had to choose. The mechanical and civil/structural did still have some joint things they still had together and electrical, we never saw them again (laughter).

When you are doing the course, you are obviously coming across some very interesting subjects. Were you able to do work experience during your Uni years?



1969 Civil and Structural Engineering students, University of Western Australia.

As part of the course, in the long summer holiday, between year two and three and three and four, we had to get a job in some area associated with engineering and the University tried to make that easy for you because they would have people put things up on the notice board. So, you could basically search through the Uni and get something. In the first year I worked, and worked in inverted commas, because you don't know much, so I actually worked in the drawing office down in the fertiliser factory . . . down in Kwinana. Can't think of the name right now, so I was in the drawing office drawing, probably stuff they never used (laughter). The following year, I went to, got a job over east with the Snowy Mountains Hydro Electrical Authority, again in the drawing office, not being that useful as far as I could tell but that was very interesting. They were building the last of the dams at that stage.

That's fantastic experience.

Yes,

You'd never get that here.

And then I had to write a report about it, I still have the report somewhere. I should do something with that, shouldn't I? I didn't keep the one from the CSIRO, not CSIRO (*is it CSBP? PV*) the fertiliser place down, it's still there, I just can't think of its name. As I said, I

was just in the drawing office, I don't remember anything I did there. Yeah, so that was part of the requirement so everyone got some kind of a job and had to do a report.

That would have been very interesting; going east . . .

Yeah, both of those work experience type things scared me more than the engineering because you were expected to know stuff and do stuff, something useful and of course you don't know very much (laughter).

No, but you would have picked up stuff; you would have taken (*in PV*) a lot.

Yes, yes.

For me, I'm really interested in why people choose and select the particular area they get into. Just before we get into that, you mentioned you had a long-term boyfriend at that time, and I understand that you married before graduating.

Yes, after we finished Uni but before the graduation ceremony. So, I graduated with my married name, of course these days, I would have kept my maiden name I think. Yes, so we finished and passed at the end of 1970 and the graduation ceremony wasn't until April/May then next year. We got married in March. I got my degree in my married name, Roslyn MacKinlay.

Was there an expectation ever, like what your father-in-law was saying, once you were married that any work prospect was out the window because you would then be returning to your domestic . . .



1971 Roslyn MacKinlay graduation from University of Western Australia



1970 Graduating students from the School of Engineering, University of Western Australia

No, any of the jobs I ended up getting, it was not an issue, you know, you were doing the work, you were doing the work. So, it was never an issue. By choice, I worked for nine years in quite a few different offices. When I was about 30, I decided to have a child so, by choice, I took a few months off but the company I had been working for before rang me up, Keith Dodd rang me up and said, had I been de-pregnatised? He had some work, writing contracts and things that I could do in the office or at home, so I then worked part time. Then after my second son was born, a couple of years later, I officially took 11 months off but I'm not a very good mother, I mean I much prefer part time mothering than full-time mothering so I went back to work, part time to full time but I worked contract with quite a few companies in the mining industry and so we had projects going and I managed to do my work; fit in my work and produce without anyone looking over my shoulder and so it was never an issue if I needed to do something with the kids and I also had family who would pick a kid up from school if necessary, if I couldn't. So, it worked quite well for me. A lot of juggling, a lot of hard work and no sleep (laughter).

26:00

Well, you had a lot of support, that's fantastic. Do you want to name your children?

Yes, my eldest is Dan MacKinlay and both my boys were very bright. Dan got a scholarship to ANU and he did the double Arts & Science degree there, because he didn't know what he wanted to do. He had jobs, mostly working contract in setting up people's computers. He coordinated the museums in New South Wales, putting their computer stuff together about 12 years ago or something. But he had a burning desire to do a PhD in things that would change the world but he is still doing his PhD (laughs). It's taking a long time because it's a moving

target. He thinks of an idea and gets partway through and someone else has already pipped him at the post. I think he is going to finish it this year, and then he can look for a Post Doc. My second son Andy, Andy MacKinlay, he got the full scholarship to Melbourne University, in fact he was head-hunted by them. He also came sixth in the state in the TEE or ATAR or whatever it is called. He then went to Melbourne and he's been there ever since. He did the double Arts Science degree at Melbourne Uni. Both of them did that because they didn't know what they actually wanted to do. He has ended up in computer linguistics, which is the language behind the language. He worked for a while and then went back and did his PhD, honing in on this computer linguistic stuff and he's been employed in various organisations; Nictor(?), IBM and he's now with Culture Amp, which is a company that sell their services to a big company and provide and monitor their workers' satisfaction. I'm sure he won't stay there forever but he's enjoying that.

So, when were they born?

Dan was born in 1980 and Andy was born in 1982.

That's a big thing for you, that's two young children, so I understand when you say that's juggling a lot. So, you were working, at least you had part time work and work that you could do . . .

Yes, in fact all my work, I think I said, not today, but I said this to you the other day, I actually never got a job that I applied for in my life; work just came to me (laughter). I did apply for a job with Bruechle, Gilchrist & Evans when I left Uni because I wanted to do design and had an interview and they said, thanks but no thanks. They weren't employing females.

Can you just repeat that name, it was just too quick?

Bruechle, Gilchrist & Evans and there were two main partners, Peter Breuchle and Ernie Evans, I can't remember who interviewed me, it doesn't matter, I don't hold it against them (laughter).

Do you think that reason for you to be able to move from job to job, is because of Perth?

Well, it was then yes. I would have loved permanent employment but there was no such thing as permanent employment in Perth in those days. You'd be taken on as a permanent employee and when there was no work, there's the door, without any packages (laughs), redundancy payments or anything. I worked with a company called Mitchell Cox, which is an English company that owned South African interests and then a few, they bought a few companies in Perth and they were trying to get into the mining industry here and so we had a little engineering office here. I worked with them for probably about six years. We did work on Groote Island, a manganese and heavy media plant there, put a heavy media plant in at Hamersley I think, it might have been Newman, I can't remember now. One of those, this was in the 70s.

The early boom stage, wasn't it?

Yes, and in copper mines we designed and constructed copper plants, so we did a lot of work in the mining industry. A lot of small work in the mining industry, we never did any major (work) like the Newman thing, we did add-on work.

But it sounds like it was regular?

It was and what was and one of the things the South Africans developed was a, that we were working with, was a little portable plant for, not prospecting for diamonds, for . . . when you are doing surveys . . . when you are drilling for ore, well what they did when they were trying to find diamonds in the Kimberley, this is before Argyle started up, Tanganyika Holdings were searching for diamonds in the Kimberley and they would . . . there was a pipe, diamonds came from a pipe, and they were in the ground, natural.

What's a pipe?

It's a big rock structure in the ground (Roslyn is making a discrete shape with her hands) it's volcanic.

It's a discrete shape?

Yes, and diamonds were formed in there a long time ago and then if some of that is eroded by streams, they would find diamonds down the stream. This company developed this little plant to actually process the diamonds out of the stream. So, if they found diamonds then they would follow it back to the stream and that would lead the to the pipe with the mining of that, totally different. So, we built a few of these little plants, worked for Tanganyika Holdings up in the Kimberley and I remember going up there and commissioning it (laughter). It was very hot up there, so I have a photograph of me commissioning the plant, I was in charge, with my bathers on (laughter), which I don't think I'd do these days (laughter). There weren't many of us there, we were all living in the same camp.

So, what was your role? You sound like, with so many different jobs, you would be doing different things.

I was basically in the early days, I didn't do very much design, but I did small project management, small design and small project management or project management of small . . . that means everything; you write the specs, send out enquiries, choose who got the jobs, place the order, supervise the construction; smaller things in the workshop, then go up and commission it, so you were jack of all trades (laughs).

You were overseeing it?

I was overseeing it, but you know, you'd be ordering all the parts, doing nearly everything. You were the purchasing officer, I'd do some drafting yes, everything. In the small offices, that's what we did on quite a few jobs. You can't operate like that anymore. We never ever had an accident but Oc/Health and Safety would definitely be an issue (laughter).

Yeah, I worked, after I had my boys, was with Keith Dodd who was a mining engineer and he again, ran this very small office and did everything, he's a very bright guy. We built a lot of the gold plants that were built in the '80s; Sons of Gwalia, Goongarrie, a lot of ones (who) had been bought by someone else or taken down. So, we did a lot of work in the Goldfields.

In Queensland, we had a gold plant. They were almost clones of each other, it was just a matter of how big the tanks were, to suit the process so, because I had the kids then, I tended to do all the office work; put all the packages together, fill out the enquiries. We had our own draftsman and designed the stuff in the office. If we had anything significant to design, we would usually use a structural engineer to check our design because I wasn't involved in detail design. But the process side, which Keith knew backwards, he didn't need any checks on that. Yeah, so I worked with him for on and off. A project would finish and I'd go home and paint the fence for a couple of weeks, think about it's time to get some work and either he would have some more work, or some other project would come up with people I had worked with. By working with Keith, I was invited to come and work on feasibility studies with Minenco, who was the CRA engineering arm, they don't exist anymore, and did some studies with them, I'd have to read my resume now (laughs) what I've worked on. Sometimes I'd have two jobs running at once, so if I was writing the specs on things or estimating on a particular project, it was only occupying me half time so if someone said can you help us on this project, I was often working at two places at once.

Were you employed as Roslyn MacKinlay as a separate entity and subcontracted into Dodds or . . .

Basically I was forced to have my own company, so I was the only employee. So, my company worked for Keith Dodd.

I don't know how anxious you would have been when one job finished, with children, with a home and you are young, um, I wonder what next?

Well, I had a husband who was a Lawyer and technically, he was paying for the house so I didn't have to, I didn't have to worry about the mortgage. Most of my money went to day to day living and obviously, I didn't spend the last cent. I am fairly frugal (laughs).

Country Girl! (laughs)

Yes, that's right, that's where it comes from. My parents grew up in the Depression so, they were always extremely frugal.

38:15

So, you travelled a lot?

Um, my first overseas trip was in 1975 so I was mid-twenties and I actually came back via South Africa then and went and visited some of the (?) iron ore places that our company over there was working on and the Lesotho (?) Diamond Mine, I went there but back in Perth, I travelled, if I was on a project, like I would only go out for a couple of days or a day or two. Mostly, I did my work in the office and when I had the kids, I went out even less so we always had a good site supervisor, so, I would not be the main site person, I was the main office person. Personal travel, well it was much later but that first trip I did also included a business side to it.

I guess because Western Australia is such a huge state and you get into mining, and you are covering the whole of the state.

Yeah, I have been for one or two-day trips to about every mine that's out there and to some that didn't exist like Marandoo. We were doing a study on Marandoo ore, very early on in the early 70s, it was quite a different ore so processing that was going to be quite complicated so, it was just a piece of ground, now it's a major mine.

Have you been out there recently, seeing these mines?

We have driven through but haven't been out to look at the mines, no.

Did you change completely from mining to getting into civil structures?

Yeah, so in the late 90s works the contract work in project managing sort of petered out because I think the process was changing. Big companies were getting the work, oh, health and safety issues were now made it quite different the way you could do jobs, so quite a few of us, who used to go from job to job, to job, ended up maybe under employed or finding alternative employment because big companies, a lot of whom were owned by overseas people, would hire their people for a project. They would hire them from their overseas office so it sort of petered out in about '98. Joe Wyche, who I mentioned before, he has been in design all his life. He started out in Main Roads, he's worth an interview (laughter), we had actually been to Uni together and we had socialised a bit but we weren't close friends at Uni. He knew I was under employed, his wife taught my two boys at Scotch and said that he was going out on his own, he was leaving Bruechle, Gilchrist and Evans, he had been with them for quite some time, and he was going to go out on his own and would I join him? I said, that would be nice, but I haven't done any design. He said, well, I will coach you. It was probably in '99 or 2000 that he spoke to me. Yeah, I went and worked with him for about 14 years. He did coach me, a very good teacher and he has written half the stuff, well not half the stuff but has written a lot of the stuff that is actually in our code so he knows his engineering and yeah, he was a great teacher and we, I helped design all sorts of bridges and things with him. I wasn't confident to do things on my own because I was a bit late in life to go out and start doing design but I really enjoyed it and yeah, we did some amazing things.

Your career has sort of bounced from one exploding opportunity, which is mining in Western Australia to now, infrastructures; road works and bridges.

Joe did specialise in bridges, so any of the big projects like the railway, Joe was on the team to manage and to design all the bridges on that.

You mean the railway down from Perth to Mandurah?

Perth to Mandurah, and then when the Forrest Highway went in, he was the bridge person, chief designer and coordinating . . . there were two of us in his office, and the other company in the joint venture, but basically, he was responsible for all the bridges on that.

I guess, if you were still employed, you would be working on the interchange from the city . . .

I think Joe still does do some work but again, he's only in a small office, work was petering out for him, they were giving it to the big guys.

Well, you hit your stride right at the right moment (laughter). Is there anything within that period, were there unusual bridges, were there unusual building techniques or was there a new technology that came in during that time?

Not for me, but pre-stressed and post-tension concrete made a hell of a difference to bridge design. I do remember the thing that Joe was most concerned about in one of the early works when we had to widen Mount Henry, and to widen Mount Henry we actually built a new bridge next to it and that was fine. The old bridge had to be strengthened to take the bigger load, written out in the code (the phone starts to ring, interrupting the interview) and he found that very tricky.

44:25 break

So, strengthening Mount Henry, he had to drill and put post tension cables and rods and things in, he was very nervous about that but it worked, his design is very good, something quite different. Another thing we had to do on, I did most of this, the design and planning for it, we had to move a bus bridge on the Freeway, the Canning bus bridge where it had been an (*unclear?*) bridge, a curved bridge; one complete structure, and to fit in the railway, we had to move it sideways. So we did, (laughs) about 10 metres sideways to fit in the rail.

It's quite a complicated little intersection there, I've always wondered about that.

So that was challenging, quite a bit different. I guess they all are.

You have to have an ability to be thinking in 3D to be doing what . . .

Yes, yes. You do need to picture what's going on.

When you were talking about that, you said originally the bridge had been . . . something?

Incrementally launched which, anyone in the bridge-building industry knows but basically you're pre-casting a section of your bridge off site, but in the position that the road and the bridge is going to take and then you push it with big jacks forward, inch by inch, so you launch this 20 metre section, or however your design has come up with the sections you need, and . . . they are all post-stressed, we do have some pre-stressing and reinforcement in there but the main reinforcement used is post-stressing. Don't worry . . . (laughing)

I go on that bridge a lot.

So, you launch a piece and often it has temporary repairs to hold it and doesn't fall over, and then you cast the next bit on and you are actually joining these two bits on. You have already got reinforcing coming through across the joint, and then you launch the next piece and you do your 20 pieces or your 10 pieces of big bridge, of concrete. Very heavy, across a curve, you are launching across a curve mostly, to the other side of the Freeway.

I'm going to look at that now.

And Joe's done a lot of incrementally launched bridges and developed his own software to help us analyse it very carefully. I was not very good at using that software.

Yes, because I'm not from that Engineering background, thank you (laughter). I'm not from bridge building.

Actually, another thing that I ended up doing about 12 years ago. It may not be on any of my CVs that I have given you, my very first boss, Ralph Ansley, a bit like me, he consulted whenever anyone asked him and he had an acquaintance who was a stock broker, but they needed someone to manage the building of a gold plant in Panama. So, Ralph got involved and rang me and asked if I would come over. We employed Chilean Engineers. The process had really changed much, it had changed a little bit but I knew all the changes, to oversee it and to order the mine equipment so, I for a year and a half, I was still working with Joe, so I'd do Joe's work and then I would have two weeks over in Panama helping . . .

Who didn't travel?

(laughter) that's the main travel I did for work but yes, kids were grown up by then.

How exciting.

The plant worked but the management over there is, I won't mention the name of the company. It's the only gold mine that they have ever got going over there. It got going, it worked fine but the management didn't think it was necessary to buy spares until you needed them. Sometimes there is three or four months delivery so it didn't last a long time but we did our bit.

You said that things hadn't changed there . . .

The process, yes, the process is pretty much the same with a few add-ons at the end and more de-tox at the end, the same as Keith Dodd was designing in the '80s which had been developed in South Africa.

So, depending on what ore you're processing, you would need different add-ons or . . .

Yes, well mostly, the most common ore is an oxide ore and the processes are the same for it and you get a bit more out in the end and they have done things like that, oxygenating the water; that gets a bit more of the gold out. So, the process, the add-ons have been developments that have made it more efficient.

I would imagine technology has really quite (*changed PV*).

It hasn't changed in the gold . . . well so far, I'm sure it will one day but the gold processing has been the same for the last 30 something (years).

Have you done anything else other than what you were trained for?

Well, yes. Training for Engineering. We do this degree and then you go out in the big wide world and actually, you use very little of the degree (laughs), (you) learn again on the job. I guess if I had got into design, I would have used a lot more, design early on, I would have used a lot more of what I learned at Uni. By the time I did get into design, a lot of the stuff we were doing on the computer so you have to know the correct stuff to put in and what to

expect on the way out but you don't have to do the middle bit anymore. Computers were just coming in when we were at Uni and they weren't for the ordinary people to use so . . . What was the question?

The question was really, was there anything else that you did other than Engineering?

No, no.

All in that field?

Yes, all in that field, all Engineering. I did apply for one job; a job in the early 2000s with the weather bureau. I thought I would like a complete change so I applied for a job with the weather bureau and I thought I might get myself posted to Giles Weather Station or Macquarie Island or somewhere. And I did well in their test but I didn't get the job. (laughs)

What is it that Engineering has given you, would you encourage others to enter into the field? As an individual, what has Engineering provided you?

I actually would encourage males and females to get into Engineering. It's actually a very broad . . . whatever you do at Uni, you are still only learning a tiny bit of what you might do. Engineering is in everything. For me, it was a very flexible way of working. I, just as it happened, I ended up working contract but I was almost never unemployed for any, well, I was never unemployed for any length of time. It was a fantastic way of earning money, looking after my kids, I did everything I wanted to do and I had a lot of freedom in doing that. I was good at what I did. I always did what I said I was going to do which meant that other people wanted to employ me down the line but I would certainly encourage people to do it. I think you can also now, some of the offices will let women and men work reduced or part time, depending what their situation is and they have a lot more freedom with helping look after the children and a lot of, particularly the bigger companies, it's not unusual to have a bit of time off, whereas the permanent employee; I had been a permanent employee in the early years of my work, I couldn't have taken the time off.

I think there are so many things you can do in Engineering, everything around you is engineered to some degree.

53:30

You had to know about what concrete could do, you had to know what steel could do and you had to know things, like what metals you put together, corrosive aspects and things, is that something you learnt on the job?

You did learn a lot of that at Uni but we have had for a long, long, long, long time, the standards. So, we have a concrete standard, which actually sets down design rules. And the design rules that are in there are actually based on significant research that has been one and testing for destruction and they write these rules, so you follow the rules! So, you don't really have to know the intimate detail of how you got there because there because most of it has been got there by testing and research on it. They are in the codes and the codes are quite thick and you obey the code (laughter).

Institute of Engineers, are you a member of the Institute?

I'm a retired member now, but yes I was, until I retired, yes.

Is that an automatic entry once you achieve your degree?

No, I didn't become a full member until I had been working for four or five years. I think I could have got there earlier. So, in those days, you did have to have someone verifying that you were doing Engineering etc, etc; someone you were working with and I'm sure there is that and more these days. Anyone can join as a graduate member but to be a member you have to prove that you are actually in Engineering. And if you want to be a certified practicing Engineer, you have to prove that you have done all sorts of professional development every year, if you ask. I mean you don't have to fill out a form every year. So, it is quite strict as to who can say they are a member of the Institution of Engineers or a Certified Practising Engineer.

Do you have anything else you would like to add about, I guess it is about the career but it is a unique perspective that you have, or it is an unusual perspective?

Yes, mmmm, I can't think of anything in particular except that it is a great career for anybody. You can travel with Engineering, you can help save the world (laughter), we need Engineers everywhere. It is a thing you can travel with. I'm very pleased I did it. It also gave me independence. My marriage broke down in '98 and as luck would have it, we didn't actually own a lot of our house so, because I was qualified because I was working, I managed in 20 years, to buy my own house. If I had been a teacher, I could not have done it. There are so many jobs that wouldn't earn enough to start again so that really, I wasn't destitute ever because I had a career that work kept turning up in (laughs).

Thank you very much, that's been a delight, thank you.

Thanks Patsy.

Interview ends: 57 minutes 22 seconds